日本古生物学會
報告・紀事

Transactions and Proceedings
of the
Palaeontological Society of Japan

昭和 11 年　　第 2 號
1936　　No. 2

〔地質學雜誌　第 43 卷　第 508-510 號　抜刷〕
[Reprinted from Jour. Geol. Soc. Japan, vol. 43, No. 508-510.]

日本古生物學會
Palaeontological Society of Japan

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紀 事 Proceedings

[The heading in Japanese commemorates the hand-writting of Prof. M. Yokoyama, father of Japanese Palaeontology, who was Professor of Stratigraphy and Palaeontology at the Geological Institute, Imperial University of Tokyo.]

6. *A Note on Engelhardtia Genus, and its Occurrence in the Palaeogene of Korea*

By

Saburô ÔISHI

(Contribution from the Department of Geology and Mineralogy, Hokkaidô Imperial University, Sapporo).

[Read November 30th, 1935.]

The genus *Engelhardtia*, together with *Hicoria, Platycarya, Pterocarya* and *Juglans*, is one of the most interesting dicotyledonous plants belonging to the family *Juglandaceae*. Fossil records

Table 1. Geological and geographical distribution of fossil species of *Engelhardtia*.

Distribution / Species	Geological					Geographical
	Eocene	Oligocene	Miocene	Pliocene	Pleistocene	
1. *E. abscondita* SAPORTA			×			Southern Europe.
2. *E. atavia* SAPORTA		×				〃
3. *E. bilinica* ETTINGSHAUSEN			×			〃
4. *E. Brongniarti* SAPORTA		×	×	×		〃
5. *E. decora* SAPORTA			×			〃
6. *E. detecta* SAPORTA	×	×	×			〃
7. *E. Ettingshauseni* BERRY	×					North America.
8. *E. Fritschi* SCHLECHTENDAL			×			Southern Europe.
9. *E. Hassencampi* HEER			×			〃
10. *E. mississippiensis* BERRY	×					North America.
11. *E. oxyptera* SAPORTA			×			Southern Europe; North America.
12. *E. puryearensis* BERRY	×					North America.
13. *E. serotina* SAPORTA			×			Southern Europe.
14. *E. ultina* SAPORTA		×				〃
15. *E. vera* (ANDRAE)		×				〃

of it have been found dating back to the beginning of the Tertiary age, though it is very poorly known from the Pliocene and the Pleistocene strata. Fifteen species of fossil *Engelhardtia* are known to us. Very interesting to note, it is restricted not only in geographical but also in geological distribution. As shown in table 1, only four species have been recorded from the North American Eocene (in a single case from the Miocene) rocks, while the majority flourished in Europe in the Oligocene to Miocene epochs.

There are as many living species as fossil species in the southeastern Asiatic area, with a single exceptional case in central America; Table 2 shows their geographical distribution:

Table 2. Geographical distribution of living species of *Engelhardtia:*

1.	*E. aceriflora* BLUME ··········	Himalaya; Malaya.
2.	*E. apoensis* ELMER ··········	Philippines (Mindanao).
3.	*E. Colebrookiana* LINDL. ·······	Himalaya; China.
4.	*E. Esquirolii* LEVEILLE ······	China.
5.	*E. formosana* HAYATA ··········	Taiwan.
6.	*E. lepidota* SCHLECHTER ······	New Guinea.
7.	*E. nudiflora* HOOK ············	Penang.
8.	*E. Oreomunnea* C. DC. ········	Central America.
9.	*E. parviflora* C. DC. ··········	Phillippines.
10.	*E. polystachya* RADLK. ········	India.
11.	*E. rigida* BLUME ·············	Java.
12.	*E. serrata* BLUME ·············	Malaya.
13.	*E. spicata* BLUME ·············	Himalaya; Malaya.
14.	*E. subsimplicifolia* MERRILL ···	Philippines.
15.	*E. Wallichiana* LINDL. ········	Malaya.

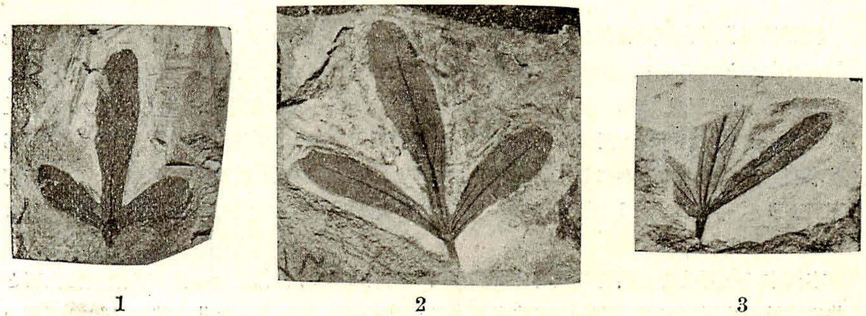
It is of the utmost interest that there is a conspicuous difference in the geographical distributions between the fossil and the existing species of *Engelhardtia;* the occurrence of the former is confined entirely to the North American and European continents, while as to the latter, they are restricted to the monsoon regions of southeastern Asia with the single exceptional case from Central America.

The specimens of *Engelhardtia* now at our disposal, which the present autohr wishes to call *E. koreanica* sp. nov., are represented by a number of well-preserved involucles. They were collected by Mr. N. UOYA from the Palaeogene coal bearing formation of Kokangen, and through the courtesy of Mr. R. KODAIRA forwarded to the author for investigation, together with many other fossil leaves collected from the same formation. The present discovery of *Engelhardtia* in Korea is particularly interesting from the phytogeographical point of view, in that it is a unique occurrence in the Asiatic continent, and at the same time it is important as it suggests the course of the recent distribution of *Engelhardtia* since the early Tertiary. *E. koreanica* shows the following characters:

Engelhardtia koreanica sp. nov.

Text-figures 1–3.

Involucle short stalked, deeply trilobate. Alae widely spreading, the angle between the median and lateral wings being 45°–70°; median one longest, the length varying between 25–35 cm., spatulate, widening gradually towards the distal portion and thence contracting more or less abruptly to a rounded or obtusely rounded apex; lateral wings shorter than the median one, but all are of nearly the same shape, though in some cases one is a little smaller than the other. Each wing bears three distinct primary nerves, of which the median one is stronger than the rest and persists to the apex of the wing; lateral ones assuming the straight course close to the lateral margins of the wing merge into secondaries about at the middle of the wing. There are 5–6 secondary nerves arising from the median nerve at an angle of about 45°, curving upwards and dissolving into fine meshes. The area where the fruit was attached is generally represented by a small area, but there is no indication of it.



1 2 3

Text-figures 1–3. *Engelhardtia koreanica* sp. nov. Nat. size. Loc. Kokangen' North Kankyô-Dô; Oligocene (upper?). Reg. No. 6478.

The Korean species is closely allied to *E. Brongniarti* SAPORTA, but there are some differences, especially in the shape of the alae, which narrow distally in ours instead of being nearly parallel-sided as in the European species. Moreover, the essential portion of the fruit in our specimens is smaller, and the lateral nerves are more prominent than in SAPORTA's species.

E. koreanica is associated with many dicotyledonous leaves, Among them were found some suggesting the leaves of *Engelhardtia* possibly of *E. koreanica*, but, since there is no organic connection between the leaves and the involucles, they will not be considered in the present paper. The result of the study of the flora of the Kokangen plant-beds is expected to appear in near the future.

Finally, the author takes the opportunity to thank Mr. R. KODAIRA in Keizyô for the loan of the material, and Dr. M. TATEWAKI in the Faculty of Agriculture, Hokkaidô Imperial University, who has offered facilities for examining the herbariums of living species of *Engelhardtia*. The author's thanks are also due to the authorities of the Tôsyôgû Sanbyakunen-sai Kinen Kai for financial he'p in prosecuting the present study.

Locality and Horizon: Kokangen, North Kankyô-Dô; Oligocene (upper ?).

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W. JONGMANS: Fossilium Catalogus. **2**, Plantae., *Juglandaceae* (1915).

B. D. JACKSON: Index Kewensis, **1**, 1895; Supplement, **1** (1886-1895); **3** (1901-1905); **5** (1911-1915); **6** (1916-1920).

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6. 朝鮮古第三紀層產化石フジバシデ屬（摘 要）

大 石 三 郎

朝鮮咸鏡北道古乾原古第三紀夾炭層產化石フジバシデ屬の苞の 1 種を *Engelhardtia koreanica* と命名せり。從來知られたる本屬の化石及び現生種の分布は興味あるものなり，即ち本屬の化石として知られたる 15 種の大部分は南歐の第三紀層より產し，僅かに 4 種が北米の古第三紀層に產出するのみ。然るに現生種 15 種の分布を見るに，唯だ 1 種中部亞米利加に存在するのみにして他は皆東亞に產し，東南亞細亞の颱風帶に生育す。故に今回東亞より本屬の化石の 1 種が產出せる事は古生植物地理學上に重要なる材料を提供せるものと云ふ可し。

本標本は朝鮮總督府燃料選鑛研究所魚谷氏の採集に係り，古乾原產の他の多數植物化石と共に京城の小平亮二氏の御好意により筆者に提供せられたるものなり。玆に記して感謝の意を表す。

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7. *A Twinned or Double Fossil Shell of Rotalia*

By

Ichirô HAYASAKA

(Contribution from the Geological Institute, Taihokù Imperial University, Taiwan).

[Read November 30th, 1935.]

Among the many well preserved fossils of marine origin collected sometime ago from the subsurface rock formation of the ground of the Tainan Higher Technological College, there are, in association with numerous minute molluscan shells, a number of forms of foraminifers, including species of some genera as *Quinqueloculina, Spiroculina, Nonion, Elphidium, Rotalia* and so forth.[1] A brief note describing the interesting occurrence, in this faunule, of small pelecypod shells bearing the testimony of having been attacked by certain gastropods, was prepared by me in 1933[2]

While picking up, under microscope, tiny tests of the foraminifers and other fossils from the sieved out residue of the soft sandy clay, I happened to find a single specimen of a twinned or duplicate shell of *Rotalia* which, I think, may be a form identical with, or, at least, very closely allied to, *Rotalia gaimardi* D'ORBIGNY (=*R. papillosa* BRADY var. *compressiuscula* BRADY,[3]) a species which is quite common in the younger Tertiary and later formations of Taiwan.[4]

The duplicity in foraminifers, living and fossil, seems by no means a very rare phenomenon,[5] but it may not be useless to

1) HAYASAKA:—臺南市附近砂丘基底の地質資料 (Geological Materials of the Substratum of the Dune Formation around Tainan). Taiwan Tigaku Kizi, **3**, (1932), p 110.

2) HAYASAKA:—Fossil Occurrence of Pelecyopd Shells Bored by Certain Gastropods. Mem. Fac. Sci. & Agr. **6**, 4, (Geology, No. 5) (1933).

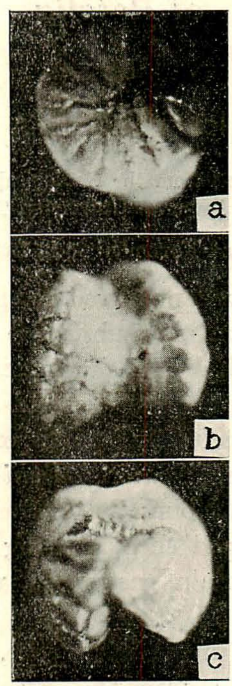
3) Challenger Report, **9**, P. 108, pl. CVII, fig. 1; pl. CVIII, fig. 1. (1884).

4) H. YABE and S. HANAZAWA:—Tertiary Foraminiferous Rocks of Taiwan (Formosa). Sci. Rep. Tôhoku Imp. Univ., (2) (Geology) **14**, 1. (1930).

5) J. J. GALLOWAY:—A Manual of Foraminifera (1933), p. 34.

record here the fossil occurrence of an example from Taiwan.

The twinning in the specimen under consideration takes place in such a manner that two shells are brought into contact with their dorsal sides, the apical parts being partly fused together and having the ventral or apertural sides directed outward, thus the dextrality and the sinistrality of volution being represented simultaneously. The pictures in the text-figure may supplement this compendious description. The sutures on the ventral surface are rather deep and ornamented with a granulation along the sides. The limbate nature of the dorsal sutures is recognized fairly well under microscope, although it is not easy to realize it in these pictures.



Text-figure 1. A Twinned fossil of *Rotalia*, viewed from three differrent sides. About 27.5 times natural size.

a. Ventral view, with the aperture on the right side, open upwards.

b. Amalgamated dorsal parts of the two individual shells.

c. Apertural side, showing that the apertures of the two individual shells become continuous over the amalgamated peripheral margin: the compound aperture is directed upwards just like in a.

The double specimen is, or rather each half is notably smaller than the average size of the species that are found together.

The picture (a) is a lateral view of the twinned specimen. The middle (b) and the lower (c) pictures show that the planes of volution of the two parts or individuals are not parallel to each other; the peripheral margins become united and amalgamated where the planes of volution approach each other. Here the aperture of the double specimen is situated. Turning again to the picture (a), we see, on the right side, the aperture of one half of the specimen. It is important to see that there is the aperture of the other half on the opposite side of the twinned specimen, exactly corresponding in position to the one observed in the picture. This seems to show that while the two shells that were almost at the same phase of developement were drawn close together and united, the protoplasm of both the life to individuals endeavoured to reduce the life to single.[6)]

Further, the apertures of the two halves in reality become continuous over the amalgamated peripheral margin described above. This is shown in the picture (c), though unfortunately it is not an excellent one.

化石 *Rotalia* の雙生標本（摘要）

早坂一郎

臺南高等工業學校敷地の下に產する無數の化石中に唯一個であるが，*Rotalia* の雙生標本がある。これは *R. gaimardi* D'ORBIGNY であらうと思はれる。雙生の仕方は，二つの殼が背面で癒着した形であるが，外側に向いた殼口は殼の緣を越えて連續して一つの細長い口となつ居る。これを見ると，同じ程度に發達した二つの個體が次第に互に引き寄せられて，二個體の protoplasma が一つの生體とならうとしたものゝ様に思はれる。

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6) An explanation of "plasmogamy" in foraminifers is given by J. J. LISTER in LANKESTER's Treatise, Part I (1903), p. 125. It seems to suggest the process of duplication of the fossil *Rotalia* under consideration to be as here inferred.

8. *On the Occurrence of Temnotrema rubrum in the Pleistocene of Turumi, Kwantô Region*

By

SYÔZÔ NISIYAMA.

(Contribution from the Geological Institute, Tohoku Imperial University, Sendai, Japan.) [Read November 30th, 1935]

Some years ago, Mr. F. UEDA, then a member of our Institute, collected a small sea-urchin from the Namamugi fossil zone at Kagetu-en, Turumi-si Kanagawa-ken, which is referable to *Pleurechinus ruber* L. DÖDERLEIN, a species first founded on living specimens from "Kadsiyama," Japan. This is the first record in fossil.

Genus ***Temnotrema*** Al. AGASSIZ, 1863.

Temnotrema Al. AGASSIZ. 1863, Proc. Acad. Nat. Sci. Phila., p. 358.

Genohaplotype: *Temnotrema sculptum* Al. AGASSIZ, 1863, op. cit., p. 358. -H. L. CLARK, 1912, Mem. Mus. Comp. Zool., Harvard, **34**, p. 321, pl. 112, f. 1, 2. (Type figured: Kagosima Bay; W. STIMPSON Coll.: Mus. Comp. Zool.) Type by monotypy at the time.

Metonyms. Genus *Pleurechinus* Al. AGASSIZ, 1872.

Pleurechinus Al. AGASSIZ, 1872, Mem. Mus. Comp. Zool., Harvard, **3**, p. 167, (subgenus ad *Temnopleurus* L. AGASSIZ, 1841).

Genohaplotype: *Temnopleurus bothryoides* L. AGASSIZ and E. DESOR, 1846, Ann. Sci. Nat., sér. 3, **6**, p. 360. (Gallopagos Island; MICHELIN. Coll.: in L'école des mines in Paris). Type by monotypy at the time.

(non *Pleurechinus* L. AGASSIZ, 1841, Intr. Mn. Scut., Mon. Ech., 2, p. vii.)

Genohaplotype: *Cidaris bothryoides* N. G. LESKE, 1778, Addit. ad KLEIN nat. Disposit. Ech., p. 154. (Probably the Cretaceous of Germany: Dresden Mus.) Type by monotypy at that time.

Genus *Dicoptella* J. LAMBERT et P. THIÉRY, 1911.

Dicoptella J. LAMBERT and P. THIÉRY, 1911, Ess. nomencl. rais. Ech., 3, p. 232.

Genorthotype: *Dicoptella agassizi* LAMBERT and THIÉRY, 1911, op. cit., p. 232. =*Pleurechinus bothryoides* Al. AGASSIZ, 1881, Rep. Challenger, **3**, Ech., p. 108, pl. xa, f. 1, 2. (Kobe, Japan: 8–50 fathoms: Brit Mus.) Type by original designation[1].

Homonym. Genus *Temnotrema* N. A. POMEL, 1883.

Temnotrema N. A. POMEL, 1883, Thèses Class. méthod. Gen. Ech., p. 87.

Genohaplotype: *Temnopleurus hardwickii* Al. AGASSIZ, 1872, op. cit., p. 166. (N. E. end of Japan: W. STIMPSON Coll.: Mus. Comp. Zool.) Type by monotypy at the time.

(non *Temnotrema* Al. AGASSIZ, 1863, op. cit.)

The genus *Pleurechinus* was established without diagnosis by L. AGASSIZ, in July, 1841 (l. c.), for *Cidaris bothryoides* N. G. LESKE. The type specimen of this species is, according to J. LAMBERT, derived from a Cretaceous (?) deposit in Germany, and kept now in the Dresden Museum. In December of the same year, in the Preface of the 'Anatomie du genre *Echinus*' page 8, AGASSIZ defined the genus and selected *Cidaris bothryoides* LESKE as the type species. His generic diagnosis, however, does not agree with the features of LESKE's *bothryoides*; his '*Cidaris bothryoides* LESKE' is really a specimen collected by M. STOKES, and perhaps a recent form probably of *Microcyphus*; but his type specimen is lost and hence the type species is unrecognizable at present, as already stated by LAMBERT[2] and CLARK. In 1846, however, L. AGASSIZ and DESOR threw away the generic name and transferred their *bothryoides* in *Temnopleurus*. The type specimen of *Temnopleurus bothryoides* is a fine bare test in MICHELIN's collection (L'école des Mines in Paris: labelled "Coll. MICHELIN, Iles Galapagos."[3]), to which their diagnosis of this species applies. Contrary to their expression that

1) J. LAMBERT and P. THIÉRY described "Type: *D. agassizi* LAMBERT et THIÉRY, vivant des mers du Japon. Cette espèce est l'ancien *Pleurechinus bothryoides* Al. AGASSIZ, 1881, Rep. Challenger, 3, p. 108, pl. xa, f. 1–2 (non L. AGASSIZ-Juillet 1841, Mon. Ech., Mon. Scut., p. 7), parfaitement figuré par DÖDERLEIN, 1903 Jena. Denkschr., tab. 61, f. 1–2." The Challenger specimens are now stored in the British Museum; Al. AGASSIZ' *Pleurechinus bothryoides* is a composite species and distinguished by MORTENSEN and CLARK through there examination as follows:—

1. *Temnotrema sculptum* Al. AGASSIZ, 1863. = *Pleurechinus variegatus* Th. MORTENSEN. Kobe, Japan. 8–50 fathoms. May 17, 1875.
2. *Temnotrema decorum* DÖDERLEIN, 1914. = *Pleurechinus bothryoides* (L. AGASSIZ). Station 186. Sept. 8, 1874. Lat. 10° 35′ S., Long. 142° 18′ E. 8 fathoms. Coral sand.

The Japanese specimens are referred to *T. sculptum*, *however*; DÖDERLEIN'S figures (l. c., 1–1b) are really a *T. decorum*.

2) LAMBERT states that it may be *M. zigzag* from Japan.

3) MORTENSEN, 1904, Dansk. Vidensk. Selsk. Skr., ser. 7, vol. 1, (1), p. 83.

their *Temnopleurus bothryoides* is identical with LESKE's *Cidaris bothryoides*, it is now quite evident that their diagnois does not apply either to the fossil species figured by KLEIN and described by LESKE or to the species in STOKE's collection. This specimen (in Paris) was erroneously taken by Al. AGASSIZ (l. c.) and by later writers as the type specimen of *Pleurechinus bothryoides*. LAMBERT[1], in 1907, gave a new name *Opechinus michelini* to the Paris specimen based on the description of AGASSIZ[2], but the specimen according to MORTENSEN cannot be referred to the genus *Opechinus*; the last author examined the type specimen and found that its description by Al. AGASSIZ is incorrect. MORTENSEN unfortunately used the generic name *Pleurechinus* for it, although the name must be rejected from the story cited above. Neither *Pleurechinus* nor *Opechinus* being applicable to the Paris specimen, its generic name must be put into a renewed consideration. Judging from its description and figure, it seems to be congeneric with a small sea-urchin from Japan, described in 1863 by Al. AGASSIZ under the name *Temnotrema sculptum*, as stated by CLARK and DÖDERLEIN. Later the specimen was believed to be a young *Temnopleurus hardwickii*, and *Temnotrema* was hence placed in the synonymy of the *Temnopleurus*. In 1911, LAMBERT and P. THIÉRY proposed a new generic name *Dicoptella* for the species, under the old rule of 'once synonym, ever synonym'; this action, however, is not tenable and *Temnotrema* stands now valid.

The genus *Temnotrema* is sufficiently distinguished from *Temnopleurus* by its usually non-crenulate tubercles, (though crenulated in some large specimens of *sculptum*), the uniform size of the spines and the uniform aspect of both sides of the test as to tuberculation. Since the genus was recently so fully revised by

1) LAMBERT, 1907, in E. PACHUNDAKI, Revu. intern. d'Egypte, vol. 4, p. 17; LAMBERT and THIÉRY, 1911, Ess. nomencl rias. Ech., 3, p. 232. "L'un de nous a créé pour le prétendu *Temnopleurus bothryoides Agassiz*, 1846, der Galapagos, réellement différent du *Cidaris bothryoides* LESKE. Cette espèce qu'il ne faut confondre avec notre *Dicoptella agassizi*.

2) Al. AGASSIZ, 1873, in the Mem. Mus. Comp. Zool., vol. 3, p. 465 described that "there are four deep disconnected pits of about equal size along the sutures of the plates above the ambitus." The type spcimen is, however, according to MORTENSEN, an uncommonly large, (40 mm. in diameter, 31 mm. high), beautiful, naked test having only two large, deep disconnected pits along each horizontal interambulacral suture and one in each ambulacral horizontal suture.

MORTENSEN and by CLARK, here the repetition is avoided.

The species not belonging to the genus are as follows:

Recent Species.

1. *T. sculptum* Al. AGASSIZ, 1863, op. cit. p. 358. (l. c.)
2. *T. rubrum* (L. DÖDERLEIN) H. L. CLARK, 1919, op. cit., p. 319. (see below).
3. *T. scillae* (A. G. MAZZETTI) CLARK, 1912, op. cit., p. 318.
   Pl. scillae (MAZZETTI) Th. MORTENSEN, 1904, op. cit., p. 87, pl. 1, f. 9, 10. 17 and 18. (Red Sea: in Acad. Sci. Modena.)
4. *T. döderleini* (MORTENSEN) CLARK, 1912, op. cit., p. 319.
   Pl. döderleini MORTENTEN, 1904, op. cit., p. 77, pl. 1, f. 12, 13, pl. 2, f. 1, 7 and 8 (off Tung Kaben, in Siam Gulf: 6 fathoms sandy: MORTENSEN Coll.: Copenhagen Mus.)
5. *T. siamense* (MORTENSEN) CLARK, 1912, op. cit., p. 318.
   Pl. siamensis MORTENSEN, 1904, op. cit., p. 79, pl. 1, f. 2, 7, 11, 20, pl. 2, f. 2, 9, 14, 15 and 22. (Koh. Mesan, in Siam Gulf: 3–15 fathoms: MORTENSEN Coll.: Copenhagen Mus.)
6. *T. maculatum* (MORTENSEN) H. L. CLARK, 1912, op. cit., p. 318,
   Pl. maculatus MORTENSES, 1904, op. cit., p. 89, pl. 1, f. 4, 14. (Siboga Stations: 43, 99, 164, 258 and 315: Amsterdam Mus.)
7. *T. hawaiiense* (Al. AGASSIZ et CLARK), Clark, 1912, op. cit., p. 319, pl. 99, f. 1–3. (Albatross Station: 3823, 3847, 3871, 3872, 3876 etc. in Hawaiian Islands: 13–222 fathoms. Mus. Comp. Zool.)
8. *T. decorum* DÖDERLEIN, 1914, Fauna südwest-Austral.: Ech., p. 459.
   Pl. bothryoides L. AGASSIZ and DESOR, 1846, op. cit., p. 360.-L. DÖDERLEIN, 1903, op. cit., pl. 61, f. 1–lb.
9. *T. pallescens* CLARK, 1925, A Cat. Rec. Sea-urchins Brit. Mus., p. 90, pl. 7, f. 5, 6. (Billiton: Brit. Mus.)

Fossil Species.

1. *P. javanum* (K. MARTIN) comb. nov.
   Pl. javanus MARTIN, 1880, Tertiärsch. aus Java, App. p. 2, f. 1–lb. (Koen. Kelier, Jogjakarta, Java: Miocene: Lyden Mus.)
2. *T. bigoti* (J. LAMBERT et P. THIÉRY) comb. nov.
   Dicoptella bigoti J. LAMBERT and P. THIÉRY, 1911, op. cit., p. 232, pl. 7, f. 1–3. (Gourbesville, Mache; Miocene: LAMBERT Coll.: In Facult. Sci. Caen.)

Temnotrema rubrum (L. DÖDERLEIN, 1885) H. L. CLARK, 1912.

(Pl. I, figs. 1-21)

Temnotrema ruber (DÖDERLEIN) CLARK, 1912, Mem. Mus. Comp. Zool., Harvard, 34, (4), p. 319. (asynonym, nominal.)

Pleurechinus ruber LÖDERLEIN, 1885, Archiv. für Naturg., 51 (1), p. 92 (20), (Kadsiyama at Tokyo Bay, in 20 fathoms: DÖDERLEIN Coll.: in Strassburg Mus.): DÖDERLEIN, 1903, Jena. Denkschr., vol. 8, p. 706, pl. 91, f. 3–3b. (Type figured). MORTENSEN, 1904, Dansk. Vidensk. Selsk. Skr., ser. 7, vol. 1, (1), p. 84, pl. 6, f. 28, pl. 7, f. 6. (Pedicellariae of the type figured). -TOKUNAGA, Sh., 1906, Illust. Cat. Jap. Ech., pl. 8, f. 8–10. (Reproduced from DÖDERLEIN'S figures). Reg. No. 58340 in the Institute of Geology and Palaeontology, Tôhoku Imperial University, Sendai.

Fossil-Locality:—North side of Kagetu-en, Turdumi-ku, Kanagawa-ken.

Horizon:—Namamugi fossil zone (Pleistocene). Coll. by F. UEDA.

A single specimen at hand is about 16 mm, in diameter and 12 mm. in height. It has 14 interambulacral, and 16 ambulacral plates in each column; though lacking spines, oculo-genital ring and buccal membrane, it is fairly well preserved and still retains partly its natural colouration. The description of the specimen is as follows:

Test rather high (0.75 of diameter), beautifully rounded above, slightly curved inwardly at peristome, gill-slits indistinct. Peristome 6.5 mm. in diameter, being about 0.4 of that test. Apical system wanting, vascant area about 4 mm. in diameter. Ambulacra about two-thirds as broad as interambulacra at ambitus; ambulacral pores rather large, disposed in nearly straight series and close to edge of area; poriferous zone very narrow, without tubercles, about one-fourth to one-fifth as broad as interporiferous zone. 16 ambulacral plates in each column, lower and somewhat more numerous than interambulacral plates (14 in each column); one primary tubercle, on each compound plate, forming a distinct series close to poriferous zone, almost equal in size to interambulacral primary tubercles; secondary tubercles rather large, few, forming a distinct longitudinal series on inside of primary tubercles almost throughout each column; pits very small, shallow, slit-like, slightly rounded at inner ends. Interambulacra with primary tubercles in distinct longitudinal series and slightly diminishing in size towards apex and peristome; tubercles not crenulated; interambulacral plates of midzone with a primary tubercle at center, two distinct secondaries on either side, and 4–6 secondaries in a regular row on upper half; miliary tubercles rather scarce; pits in interambulacral areas also narrow and shallow, not reaching to base of primary tubercles, leaving a rather large part of horizontal suture not depressed.

Temnotrema rubrum is restricted in its present distribution to central Japan ("Kadsiyama"[1] and Ubara, Tiba-ken[2]), and is

1) "Kadsiyama" = Katiyama 加知山 in Tiba-ken?

2) Ubara 鵜原; the Station 51 of Fusa-maru of the Tiba Fisheries Experi-

known only from small depths.

BELL[1] said "a pretty strong conviction that the progress of research will result in showing that *Pleurechinus variabilis* and *P. ruber* of DÖDERLEIN are synonyms of this variable species (*P. bothryoides*)." Later, however, DÖDERLEIN maintained specific, distinction of his species from the others and MORTENSEN also, after he had examined the type specimens of all these species, recognized *Pl. ruber* as a distinct species. The two species *rubrum* (Pl. I, figs. 4–10) and *sculptum* (the genotype: Pl. I, figs. 11–18) are evidently related closely, both agreeing with each other in having much smaller pits than those in the other species of *Temnotrema*). The two, however, are distinct. The pores in larger and ambulacral plates lower in *rubrum* than in *sculptum*; they are further different more or less in tuberculation and decidedly in colouration.

Among the species now assigned to *Temnotrema* three groups are distinguishable. The first group comprises those forms characterized by smaller pits, which are shorter than the distance between the two of them on the same horizontal interambulacral suture and not bordered by a membrane, and by the possession of ten buccal plates and tentacles in the buccal membrane [viz. *sculptum* = *Pleurechinus variegatus* MORTENSEN) (Pl. I, figs. 17–18) and *rubrum*]. The second group comprises those with larger pits, which are longer than the distance between the two of them on the same horizontal interambulacral suture and bordered by a membrane, and further with ten buccal plates (viz. *decorum*, *scillae*, *siamense*, *maculatum*, *hawaiiense and pallescens*). The third group comprises, on the other hand, only one particular form characterized by having only five buccal plates and tube-feet in the buccal membrane and lacking anal plates, (*döderleini*). These three groups seem to be notworthy of generic separation, but here I rather prefer to leave them all in the genus *Temnotrema*.

Finally, I wish to record here my thanks to Prof. H. YABE, for his kind guidance during the preparation of this note and also to Mr. F. UEDA, for his kind offer of the material.

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1) F. J. BELL, 1894, Proc. Zool. Soc. London, p. 410.

2) MORTENSEN, 1904, op. cit., p. 84, pl. 1, f. 5, 6, 8 and 19. (Formosan Channel, in 35 fathoms: SUENSON Coll.: Copenhagen Mus.)

神奈川縣鶴見の更新層に *Temnotrema rubrum* の産出（摘要）

西 山 省 三

先年植田房雄學士が神奈川縣鶴見區鶴見町花月園北側（同氏の生麥化石帶）より1個の海膽を採集せられたが，是れは *Pleurechinus ruber* DÖDERLEIN に同定すべきものと思はれる。本種の模式標本は東京灣 20 尋（カヂヤマ（加知山?）附近）の處から現生種として採集され，專門家ですら僅かの人が此の標本を見た樣で，特に化石としては最初の報告である。

尙ほ *Pleurechinus* 屬には種々の困難な問題があるが，AL. AGASSIZ, 1872 年以來の *Pleurechinus* の種は大部分 *Temnotrema* に編入すべきものであり，*rubrum* は同屬の模式種 *sculptum* に近緣を有した異種のものと思はれる。*rubrum* の分布は模式標本並に教室所藏標本（東北帝國大學地質學古生物學教室登記番號 5831 の千葉縣水產試驗所々屬房丸採集地點 51 千葉縣夷隅郡鵜原(ウバラ)灣）より知られる所では殆んど中央日本太平洋岸に限られる樣であり，垂直分布も約 5 米——39 米である。

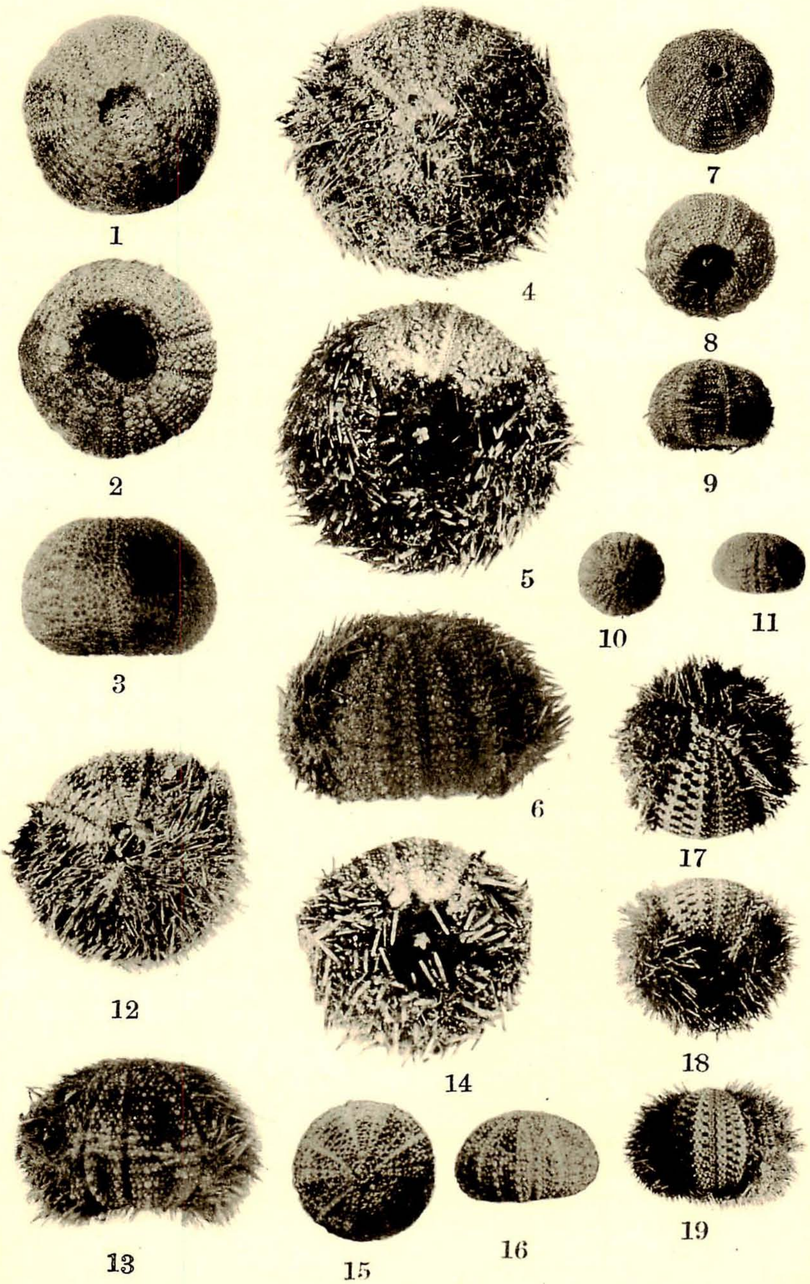
Temnotrema 屬は尙ほ三群に細分出來るが，今假に1屬と見做すことにし，今後の研究に俟つ。

Explanation of Plate

Figs. 1- 9. *Temnotrema rubrum* (DÖDERLEIN, 1885) CLARK, 1912.
- 1- 3. Fossil from Turumi, (Reg. No. 58340, in Institute of Geology and Palaeontology, Tôhoku Imperial University) X 1.7
- 4- 6. Recent, (Reg. No. 58319, in Institute of Geology and Palaeontology, Tôhoku Imperial University: Husa-Maru Station 51). X. 1.7
- 7- 9. *Pleurechinus ruber* DÖDERLEIN, (Type, in Strassburg Museum: Kadsiyama, Japan). Natural size, after DÖDERLEIN.

Figs. 10-16. *Temnotrema sculptum* Al. AGASSIZ, 1863.
- 10-11. Type, (in Museum of Comparative Zoology, Cambridge: Kagosima Bay, Japan; Coll. STIMPSON). Natural size, after CLARK.
- 12-14. Recent, (Reg. No. 58318, in Institute of Geology an l Palaeontology, Tôhoku Imperial University; Husa-Maru Station 24). X 1.7
- 15-16. *Pleurechinus variegatus* MORTENSEN, (Type, in the Copenhagen Museum: Formosa-Channel in 35 fathoms; Coll. SUENSON). Natural size, after MORTENSEN.

Figs. 17-19. *Temnotrema decorum* DÖDERLEIN, 1914.
- 17-19. *Pleurechinus bothryoides* (L. AGASSIZ et DESOR) Al. AGASSIZ, 1872, (in Strassburg Museum: Thursday Island; Coll. SEMON). Natural size, after DÖDERLEIN.



Figs. 1-9. *Temnotrema rubrum* (L. DÖDERLEIN). Figs. 10-16. *Temnotrema sculptum* Al. AGASSIZ. Figs. 17-19. *Temnotrema decorum* L. DÖDERLEIN.

9. *Nagatoella*, A New Genus of Permian *Fusulinids*.

By

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[Received February 3rd, 1936; read February 29th, 1936]

In 1925 OZAWA (8)[1], describing for the first time the extremely rich fusulinid fauna of the Permian of Nagato (southern Japan), coined the term *orientis* for a form which he regarded a new variety of *Triticites ellipsoidalis* (STAFF)—he illustrated three specimens of this form, all from different localities. *Triticites ellipsoidalis* (STAFF) [=*Fusulina ellipsoidalis* STAFF (11) and *Schellwienia ellipsoidalis* OZAWA (8)] was originally described from the Upper Pennsylvanian of Iowa. During my studies of Iowa fusulinids I have studied for comparison the descriptions of all known closely similar forms, but I was not able to determine definitely the generic affinities of OZAWA's types of *T. ellipsoidalis orientis*. Through the courtesy of the Geological Institute of the Imperial Universtty of Tokyo, and particularly through the kindness of Dr. T. KATO and Dr. T. KOBAYASHI, I have had the opportunity to study the illustrated sections on which OZAWA based his original description. These specimens have proved to be of more than ordinary interest in regard to the classification of the fusulinids and my restudy of them in the light of our present detailed knowledge of the fusulinids has yielded certain information which I believe is worthy of publication. It seems to me that these specimens represent two species rather than one

1) Numbers refer to bibliography at end of paper.

variety, and they are apparently not referable to any previously described genus. I am, therefore, proposing the new generic name *Nagatoella* for them with *Nagatoella orientis* (OZAWA), s. s., as the genotype. Also, I am proposing below the new specific name *Nagatoella kobayashii* for part of OZAWA's original types.

Recent studies of Permian fusulinids have gone to show that unusually rapid evolutionary changes took place within this family during the upper portion of Lower Permian and the lower portion of Middle Permian times. In the upper portion of the Upper Pennsylvanian, or Upper Carbonifeous, only one genus of fusulinids, namely *Triticites*, occurs abundantly and only two or possibly three other genera are known to be present in these strata. In contrast to this small variety of generic types in the Upper Pennsylvanian, twenty-six genera have been recognized in the Permian. Both of the known representatives of the new genus *Nagatoella* are associated with the genus *Doliolina* SCHELLWIEN (9, 10), and one of them, *N. kobayashii*, n. sp., is also associated with the genera *Neofusulinella* DEPRAT (3), *Parafusulina* DUNBAR and SKINNER (5), and *Ozawainella* THOMPSON? (12)—these four associated generic types indicate Middle Permian age.

Systematic Descriptions

Genus **Nagatoella** THOMPSON, n. gen.

The only species which I can refer definitely to this genus are *N. orientis* (OZAWA), the genotype, and *N. kobayashii*, n. sp. described below. The form which DEPRAT (4) described as *Fusulina lepida* in 1914 from Cammon and which OZAWA (8) described as *Schellwienia lepida* in 1925 from Nagato may represent this genus, but from a study of the published illustrations and descriptions, I am inclined to doubt that it is congeneric with *N. orientis*, though it may be regarded by some as a primitive representative of this genus.

From a study of the holotype of the genotype and the types of the only other known congeneric form, I have drawn up the following generic diagnosis of *Nagatoella*.

Diagnosis of Nagatoella.—Shell large, ellipsoidal. Axis of coiling essentially straight. Poles blunt and broadly rounded. Mature shells contain at least thirteen volutions and are 6 to 7mm. in length and 3.5 to 4.5mm. in width. Form ratio 1 : 1.2 to 1 : 1.7 The innermost volution is very broadly ellipsoidal, but the next other four to five volutions become rather elongate, and the form ratio of the remaining outer volutions becomes slightly larger. The septa are numerous. They are composed of the downward deflection of the tectum of the spirotheca and a lighter less dense layer on the posterior side which may be the downward extention of a portion of the keriotheca of the spirotheca. The septa are very heavily coated by layers of dense calcite which are not developed in the outermost volutions, but which essentially fill the chambers in the polar regions of the inner volutions. These deposits of dense calcite increase in thickness toward the poles and they extend from the septa onto the upper and lower surfaces of the spirotheca. The extreme basal portions of the septa are acutely fluted at rather broadly spaced intervals and the forward fold of one septum joins the backward fold of the following septum so as to form a very low opening from the base of the following chamber. These openings are later closed, after the tunnel is developed, by the dense calcite layers which cover the septa. The fluting increases in intensity only slightly poleward from the tunnel. The proloculum is essentially spherical and it is of moderate size. The shell is essentially symmetrical throughout growth, and the rate of increases of the chambers is very uniform. The spirotheca is composed of a tectum and a coarsely alveoli keriotheca. In the innermost volution of the genotype the spirotheca is very thin and measures only about 5 microns, but in the outer volutions it become as thick as 100 microns. The tunnel is well developed and it is very low and wide. Chomata are developed in the inner four to five volutions and there they are very low and are essentially symmetrical. In the outer volutions the chomata are not developed.

The genus *Nagatoella* appeares to be a direct descendent of the genus *Triticites* GIRTY (7). *Nagatoella* seems to have developed from typical *Triticites* by changes which included a reduction of the chomata, a more uniform and different development of the septal fluting, a more gradual increase in the thickness of the spirotheca with growth of the individual, the developement of the dense calcite deposits on the septa and spirotheca, and the change of the general development of the shape of the shell. *Triticites ordinatus* CHEN (2) of the Swine limstone, which is probably upper Lower Permian or possibly lower Middle Permian in age, of southern China represents the group of highly developed *Triticites* from which *Nagatoella* was probably developed.

Typical representatives of *Nagotoella* may be distinguished from typical representatives of *Pseudofusulina* DUNBAR and SKINNER (5) by their more nearly uniform and lower septal fluting, the dense calcite deposits on their septa and spirotheca, the marked difference in the shape of their shell, and their more rapidly thickening spirotheca. The type of *Nagatoella* is similar in many respects to the type of *Leeina* GALLOWAY (6), *L. fusiformis* (SCHELLWIEN), but it differs from that genotype especially in that the dense calcite deposits extend on its septa and spirotheca throughout the shell, its septa are more weakly and uniformly fluted, its shell has a different shape and rate of developement, and its chomata are better developed. The thick spirotheca, the rather well developed chomata, the low broad septal fluting, the heavy deposits of dense calcite on the septa and spirotheca throughout the length of the shell, and the general shape of the shell of *Nagatoella* serve to distinguish representatives of this genus from those of *Palaeofusulina* DEPRAT (3), "*Gallowaiina*" CHEN[1] (1), and *Quasifusulina* CHEN (2).

As was pointed out by OZAWA (8) in his original description of the genotype, the sagittal section of *Nagatoella* resembles sagittal sections of *Doliolina* SCHELLWIEN. Also, the shape of the shell of *Nagatoella* resembles that of *Doliolina*. However, the similarity of these two genera is entirely superficial for, in contrast to *Doliolina, Nagatoella* possesses a tunnel bordered by chomata, its septa are fluted, it has dense calcite deposits on the septa and spirotheca, and it does not possess parachomata.

Nagatoella orientis (OZAWA)

Plate II, figures 1, 2

Schellwienia ellipsoidalis orientis OZAWA [part], 1925, Imp. Univ. Tokyo, Jour. Coll. Sci., vol. 45, art. 6, pp. 22–23, pl. 8, fig. 3 [not pl. 6, fig. 1a; pl. 8, fig. 5].

OZAWA described this species as a new variety in 1925 and illustrated three specimens, all from different localities in Nagato. I have studied all three of these specimens in great detail and I have reached the conclusion that, although they are closely related, in the light of our present detailed knowledge of the fusulinids they should be regarded as representing two rather than one species. I am, accordingly, preserving OZAWA's name for one of these specimens (see Pl. II, figs, 1, 2) and I am here designating

1) The generic name *Gallowaiina* CHEN, 1934, is apparently to be considered a homonym of *Gallowayina* ELLIS, 1932 (proposed for an orbitoid in *Am. Mus. Novitates*, no. 568)

it as the holotype of *N. orientis* (OZAWA). I am referring the remaining two specimens, originally illustrated by OZAWA as *N. orientis*, to the new species described below as *Nagatoella kobayashii*. The normal procedure would perhaps be to regard OZAWA's two illustrated conspecific types as representing *N. orientis* and make the third specimen the type of a distinct species. However, I wish to base the new genus *Nagatoella* on the specimen illustrated as figures 1 and 2 on plate II and I prefer to preserve OZAWA's name for the genotype.

Since a part of OZAWA's original description of this species was based on specimens which I am now referring to a distinct species, I am redescribing *N. orientis* based solely on the holotype as follows:

Shell large, ellipsoidal. Axis of coiling essentially straight. Lateral slopes low and convex. Poles very blunt and broadly rounded. The innermost volution is subspherical, the second volution has a form ratio of about 1 : 1.6, and the remaining outer volutions have a form ratio of about 1 : 2.0. The holotype consists of ten volutions and it measures about 3.3mm. in width and 6.6mm. in length.

The spirotheca is very thin in the inner volutions, but it becomes rather thick in the outer volutions. It is composed of a tectum and a keriotheca, and deposits of dense calcite cover its surfaces in all volutions except the outer one. The alveoli of the outer volutions are very coarse. The thickness of the spirotheca in the center of the first to the ninth volution measures 5.0, 8.0, 10.5, 12.3, 17.5, 40.0, 52.5, 61.5, and 87.5 microns, respectively.

The proloculum is essentially spherical and its inside diameter measures about 140 microns. The rate of expansion of the shell is rather uniform and the total widths of the first to the ninth volutions measure 310, 425, 565, 750, 960, 1275, 1625, 2050, and 2550 microns, respectively.

The septa are thick. They are composed of a tectum and a lighter thicker layer on the posterior side which is apparently a continuation of the keriotheca. Either side of the septa is coated with rather dense thick deposits of calcite which essentially fill the chambers in the polar regions. These deposits extend onto the lower and upper surfaces of the spirotheca. The extreme lower portions of the septa are rather acutely fluted at regular intervals and the forward fold of one septum joins the backward fold of the following septum so as to form small openings from the base of one chamber to the base of the following chamber. The middle and upper portions of the septa are essentially unfluted. The openings at the base of the septa are closed in the inner volutions by the dense calcite deposits on the septa. However, the closing of these openings is slightly behind the development of the tunnel.

The tunnel is very low and broad. It is only about one-third as high as the chambers and the tunnel angle is slightly larger than 26 degrees in the ninth volution. In the inner four to five volutions the tunnel is bordered by low essentially symmetrical chomata, but in the outer volutions the chomata are apparently undeveloped.

Nagatoella orientis may be distinguished from *N. kobayashii* n. sp., by its lower and more weakly developed septal fluting, its heavier deposits of dense calcite on the septa and spirotheca and by its slightly more rapidly expanding shell. *N. orientis* resembles in general appearence *Triticites ordinatus* CHEN (2) of the Swine limestone of southern China, and it seems probable that *Nagatoella* developed from this type of highly developed *Triticites*. However, in *T. ordinatus* there are well developed heavy chomata throughout the shell and the septa and spirotheca do not contain the heavy deposits of dense calcite found in *N. orientis*.

Occurrence.—This species occurs in the Permian limestone, probably Middle Permian, of Kaerimizu, Akiyoshi-Dai, Nagato, where it is associated with *Doliolina claudiae* DEPRAT (see Pl. II, fig. 3).

Type.—The holotype is in the paleontological collection of the Imperial University of Tokyo

Nagatoella Kobayashii THOMPSON, n. sp.

Plate II, fiigures 4—6

Schellwienia ellipsoidalis orientis OZAWA [part], 1925, Imp. Univ. Tokyo, Jour. Coll. Sci., vol. 45, art. 6, pp. 22–23, pl. 6, fig. 1a; pl. 8, fig. 5 (not pl. 8, fig. 3).

Shell large, ellipsoidal. Axis of coiling essentially straight throughout the length of the shell. The inner four to six volutions are elongate ellipsoidal and the outer volutions become relatively shorter and the form ratio becomes larger. The illustrated axial section of one of the cotypes of thirteen volutions measures 4.3mm. in width and 7.1mm. in length. The form ratio is about 1 : 2.8 for the fourth volution and 1 : 1.7 for the thirteenth volution. The external furrows are very shallow. The poles are very blunt and are broadly rounded.

The spirotheca is rather thick. It is composed of a tectum and a keriotheca In the inner five to six volutions the spirotheca is very thin and the structure of the keriotheca can not be clearly seen, but in the outer volutions the keriotheca is thick and the alveoli are very coarse. The thickness of the spirotheca in the center of the first to the eleventh volution of the figured sagittal section measures 5.3, 5.3, 10.5, 10.5, 15.8, 22.8, 35.0, 35.0, 52.5, 79.0, and 87.5 microns, respectively; and the thickness of the spirotheca of the sixth to the twelfth volution of the figured axial section measures 17.5, 22.8, 33.3, 35.0, 70.0, 96.5, and 105.0 microns, respectively. Rather dense calcite extends with increasing thickness on the upper side of the spirotheca from the tunnel to the poles. In the inner volutions this dense calcite extends with decreasing thickness up the septa and spreads onto the lower surface of the sprotheca.

The proloculum of the illustrated sagittal section is apparently distorted and its maximum and minimum diameters measure about 156 and 100 microns, respectively. The rate of expansion of the shell is rather uniform and the total widths of the first to the eleventh volutions of the illustrated sagittal section measure 196, 282, 394, 535, 760, 1030, 1355, 1695, 2090, 2740, and 3050 microns. The total widths of the second to the thirteenth volution of the illustrated axial section measure 283, 425, 595, 775, 1020, 1300, 1640, 2065, 2620, 3055, 3680, and 4275 microns.

The septa are thick and numerous. The septal count for the first to the tenth volution of the illustrated sagittal section is as follows: 10, 13, 16, 16, 16, 20, 27, 28, 27, and 30. The septa are composed of the downward deflection of the tectum of the spirotheca and a lighter thicker layer on the posterior side which appears to be the downward deflection of the keriotheca of the spirotheca. There is a suggestion, however, that there is a definite line of separation between this lighter layer of the septa and the keriotheca. Either side of the septa is coated by dense calcite which increases in thickness poleward from the center of the shell and essentially fills the chambers in the extreme polar regions of the inner nine to ten volutions. This dense material spreads onto the upper and lower surfaces of the spirotheca. The septal flutting of this species is rather typical of the genus, but the fluting extends higher up the septa than in the genotype. The small openings at the base of the septa became closed by the dense calcite deposits of the septa and spirotheca as the tunnel was formed to furnish communication between the chambers. These openings at the base of the septa remain open only between the chambers of the outer one or two volutions.

The tunnel is low and wide. It is about one-third to one-half the height of the chambers. In the ninth volution the tunnel angle is slightly less than 22 degrees. In the inner six volutions the tunnel is bordered by very low essentially symmetrical chomata, but in the remaining outer volutions the chomata are apparently not developed. The tunnel is not developed in the outer part of the last volution.

Nagatoella kobayashii can be distinguished from the only other known representative of this genus, *N. orientis* (OZAWA), by its slightly higher and narrower septal fluting, its lighter deposits of dense calcite on the septa and spirotheca, and its slightly more slowly expanding shell.

Occurrence.—This species has been found in the Permian limestone, probably Middle Permian, at two localities in Nagato, north end of Ofuku-Dai and Nakamura of Ominemura, and it is known from six specimens. However, at one locality, Ofuku-Dai, it is known only from an axial section (Pl. II, fig. 6); whereas, at the other locality, Nakamura, it is known from a centered sagittal section, a parallel sagittal section (Pl. II, figs. 4 and 5), and three random oblique sections. It is, therefore, possible that these two sets of specimens are not conspecific, but, in regard to the septal fluting, dense calcite deposits and all measurable data, they seem to be identical. At Ofuku-Dai this species is associated with *Parafusulina* ? *edoensis* (OZAWA) and at Nakamura it is associated with *Neofusulinella simplex* (LANGE)?, *Doliolina* sp., and *Ozawainella* ? sp.

Types.—The cotypes of this species are in the paleontological collection of the Geological Institute of the Imperial University of Tokyo.

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二疊紀紡錘蟲新屬 *Nagatoella* （摘要）

M. L. THOMPSON

長門產 *Schellwienia ellipsoidalis orientis* OZAWA のタイプ標本再研究の結果，之が1變種に非ずして，2の獨立せる種なる事，又此の種は既に記載されたる如何な屬にも所屬せざることを知れり。依つて玆に此の種の爲に新屬 *Nagatoella* を樹立し，*N. orientis* (OZAWA) を以つて基本種とす。此の新屬を精細に記載し，其の系統を論じ，*N. orientis* (OZAWA) 及び *N. kobayashii* の記載と圖を附す。(小林譯)

Explanation of Plate II

All illustrations on this plate are unretouched photographs.

Figs. 1, 2—*Nagatoella orientis* (OZAWA). 1, Enlarged portion of the holotype, ×20; and 2, axial section of the holotype, ×10.

3—*Doliolina claudiae* DEPRAT. Portion of an axial section in the same slide with the holotype of *Nagatoella orientis*, ×10.

4–6—*Nagatoella kobayashii* THOMPSON, n. sp. 4, Sagittal section, ×20; 5, parallel sagital section, ×20; and 6, axial section tangential to the second volution, ×10.

日本古生物學會記事

Proceeding of the Palaeontological Society of Japan.

昭和11年2月29日 日本古生物學會第2回講演會を仙臺市東北帝國大學理學部地質古生物學教室に開く（參加者，37名）。講演者並に題目次の如し。

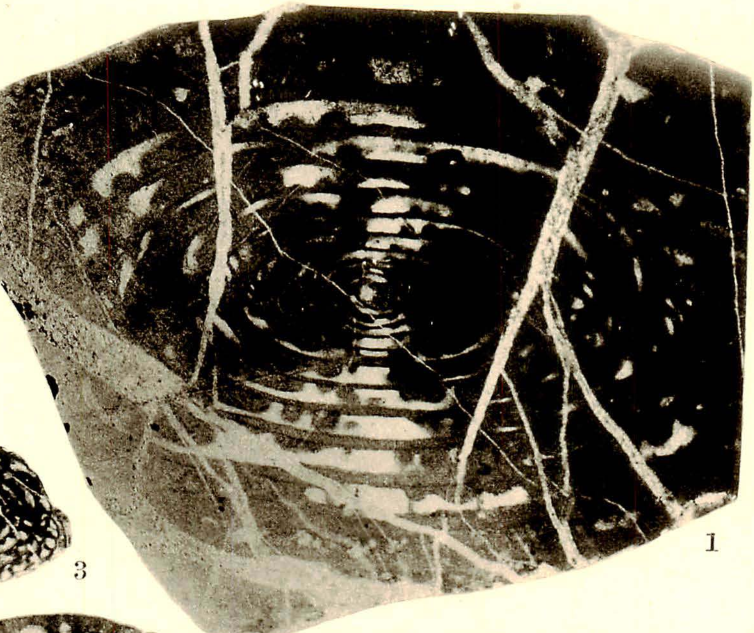
1. *Nagatoella*, a New Genus of Permian *Fusulinids*. (代讀) — M. L. THOMPSON.
2. Studies on the Fossil *Foraminifera* from the Neogene of Japan: *Foraminifera* from Muraoka-mura, Kamakura-gôri, Kanagawa-pref. — K. ASANO
3. *Pseudononon*, a New Genus of *Foraminifera* found in Muraoka-mura, Kamakura-gôri, Kanagawa-pref. — K. ASANO
4. 四射珊瑚類の成長率より推定されたる泥盆紀の赤道 — 馬 廷 英
5. 日本產珊瑚化石 *Astrocaenia japonica* EGUCHI に就いて — 江 口 元 起
6. A Note on a New Species of *Sismondia* E. DÈSOR. from the Oligocene Deposits of Titizima. — P. NISIYAMA
7. *Microporina* 屬（蘚苔蟲）の二三の化石（代讀） — 坂 倉 勝 彥

8. 海底より採集した化石に就いて　新野弘
9. A Note of the Fossil Marine Fauna from Okinawa-zima, Ryûkyû Group.　S. NOMURA and K. HATA
10. Brief Note on the socalled *Parapachydiscus egertoni* (FORBES) from Japan.　T. MATUMOTO
11. On the *Stereoplasmoceratidae*.　T. KOBAYASHI
12. The *Dikelokephalininae* (nov.); its Distribution, Migration, and Evolution.　T. KOBAYASHI
13. Notes on Some Ordovician Fauna of Tasmania.　T. KOBAYASHI
14. Brief Remarks on the Cambro-Ordovician of Caracorum.　T. KOBAYASHI
15. On the Evolution of Glabella of *Asaphidae*.　H. Y. MA
16. On the New Genus of *Basilicoides* from the Middle Ordovician Formation of Southeastern Korea.　H. Y. MA
17. On *Parastegodon infrequens* sp. nov. from the Akasi District.　T. SHIKAMA
18. *Parastegodon* 屬に就いて　鹿間時夫
19. *Palaeoloxodon* 象の 1 新種 (代讀)　德永重康・高井冬二
20. 樺太產 *Hadrosaur* (*Trachodont*) *dinosaur* に就いて (續報)　長尾巧
21. Studies on the Changes exhibited by successive Cenozoic Flora of the Japanese Islands.　S. ENDO
22. A Petrified Wood dredged from the Bottom off the Coast of Tobisima, Yamagta Pref.　M. SHIMAKURA
23. 樺太產白堊紀植物化石の 2, 3.　島倉巳三郎

入會者

三月十日までの入會者次の如し (* を附せるは日本古生物學會規則による部會のみの會員なり)

*伊藤益雄	市村賢一	太田恭
*河村良介	菊地勘左衛門	小畠信夫
兒島勘次	神保悳	*竹崎茂留
塚本義光	永幡節誕	*畠田和一
羽田重吉	堀内一雄	八木貞助
米竹治一	*A. K. Miller,	*M. L. Thompson.



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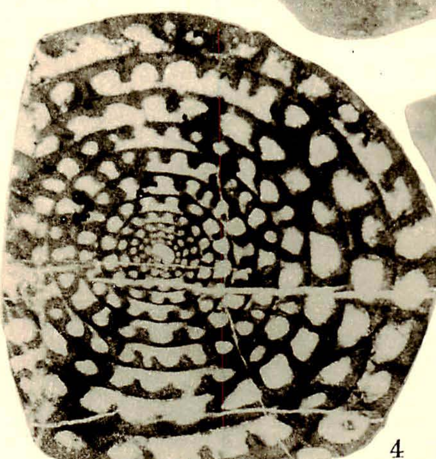

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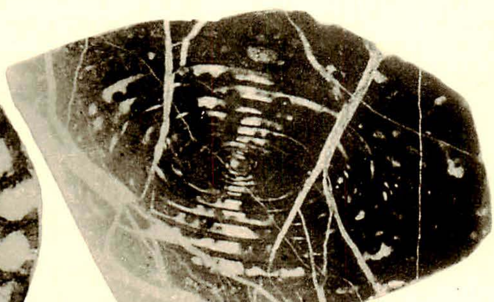

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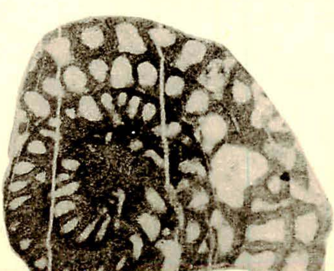

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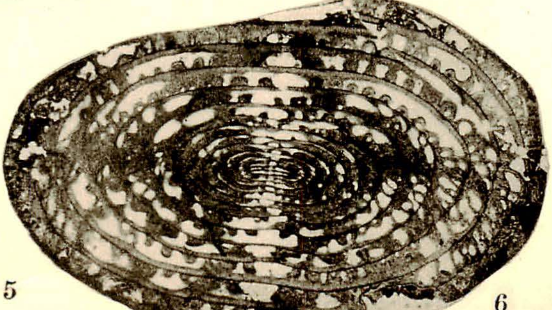

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日本古生物學會規則

1. 本會ハ日本地質學會ノ部會ニシテ日本古生物學會ト稱ス
2. 本會ハ古生物學及ビ之レニ關スル諸學科ノ進步ヲ助ケ斯學ノ普及ヲ圖ルヲ以テ目的トス
3. 本會ハ第2條ノ目的ヲ達スルタメニ總會及講演會ヲ開ク
4. 本會ノ紀事及ビ會員ノ寄稿ハ地質學雜誌ニ揭載シ 其ノ別刷ヲ日本地質學會々員ニアラザル本會々員ニ配布ス
5. 本會ノ會費ハ年額3圓トス, 但シ日本地質學會々員ハ年額1圓トス
6. 本會ニ次ノ役員ヲ置ク

會長	1名
評議員	數名

7. 役員ノ任期ヲ1年トシ會員中ヨリ總會ニ於テ選擧ス

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東京帝國大學理學部地質學教室

日本古生物學會

(振替口座東京第84780番)

Constitution of the Palaeontological Society of Japan.

Article 1. The Society shall be known as the Palaeontoglogical Society of Japan. It forms a section of the Geological Society of Japan.

Article 2. The object of the Society is the promotion of palaeontology and related sciences.

Article 3. This Society to execute the scheme outlined under Article 2, shall hold annual meetings and discussions.

Article 4. Proceedings of the Society and articles for publication shall be published through the Journal of the Geological Society of Japan. Separates and circulations will be sent to members of the Palaeontological Society who are not members of the Geological Society of Japan.

Artiele 5. The annual dues of this Society is two dollars for the foreign members of the Society.

Article 3. This Society shall hold the following executives. President one person, Councillors several persons.

Article 7. The President and Councillors shall be elected annually. The President and Councillors shall be elected from the Society body by vote of its members. All elections shall be ballot.

All Communications relating to this Journal should be addressed to the

PALAEONTOLOGICAL SOCIETY OF JAPAN

Geological Institute, Faculty of Science, Imperial University of Tokyo, Japan